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Journal of the Biological Photographic Association Vol. 26, No. 3 August, 1958

Description of New Quarters of Mayo Clinic Section of Photography

LEONARD A. JULIN, F.B.P.A.

Section of Photography
Mayo Clinic, Rochester, Minnesota

IN 1957, when the Biological Photographic Association met in Rochester, Minnesota, for its twenty-seventh annual meeting, the program included a tour of the newly occupied quarters of the Section of Photography at the Mayo Clinic. A number of members who participated in the tour, as well as others who were not present, have expressed a desire to have photographs of these quarters. Therefore, this paper will be mainly a pictorial presentation.

The year 1957 marked the fiftieth anniversary of the Section of Photography, which had its beginning in 1907, when a professional photographer was hired for full-time duty. At that time, a small studio and darkroom were provided in the basement of St. Mary's Hospital, 1 mile from downtown Rochester. In 1914, the section was moved into the attic of the newly constructed clinic building, which was located in the downtown area. Here the department could be proud of its studio, with north skylight and several darkrooms that were painted all black. With the growth of the clinic, it became necessary to increase the personnel in the section and to add new photographic activities. At various times, the section expanded into adjoining areas but the available space was limited and eventually it became inadequate. It was then that each member of the section was asked to list desirable features that should be included in new quarters and also to list any undesirable features that should be avoided. Much thought and many discussions were devoted to these matters; as a consequence, the new quarters are extremely satisfactory.

The new area that became available was on the ninth floor of the Plummer Building, as outlined in figure 1. The building is on a corner, so the windows

Figure 1.

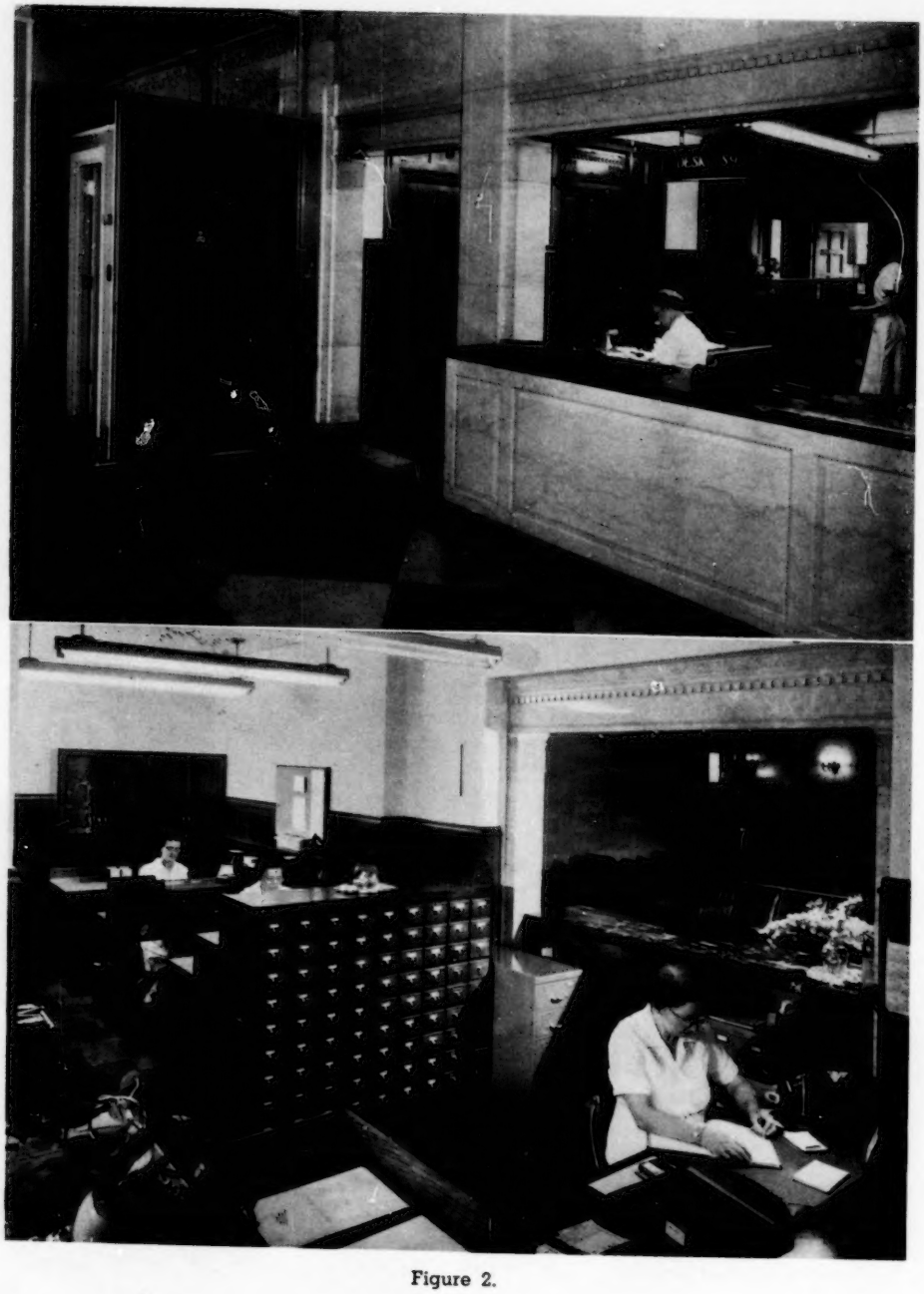

Figure 2.

Figure 3.

provide good daylight when such is desired and also offer an unobstructed view of the city. This space was formerly used for clinical examining rooms, and it consisted of a large waiting room, an area for the reception desk and a number of rooms measuring 9 by 15 feet. The waiting room had marble walls and a terrazzo floor. In the remaining area, the walls had oak-paneled wainscot with walls and ceiling of plaster, and the floors were covered with cork tile. It was desirable to keep alterations at a minimum while obtaining the maximum in convenient and efficient work space. This was accomplished quite successfully. One end of the large waiting room was walled off to form a main studio of ample proportions. Some of the rooms were used without alteration. The area for darkrooms naturally required the greatest amount of alteration.

The reception desk is shown in figure 2. The door at the left opens into the main studio. Mirrors on the upper part of the studio wall reflect the architectural ornamentation and give the waiting room an effect of spaciousness.

The view from the opposite direction (fig. 3) shows the work area immediately behind the reception desk. All incoming and outgoing orders pass this point. Here also is kept a record of the jobs in progress in the section, which usually number about 300 at any one time. The card file behind the receptionist contains information about each patient who has been photographed in past years. All incoming telephone calls are received at this point, and an "intercom" system extends to each workroom. Telephones in a number of locations can be used for communicating to persons outside of the section. The two girls behind the card file are binding lantern slides, numbering and trimming prints and checking out orders in a space that was carefully designed for the purpose. Staff physicians and other clinic personnel who bring work to the section come to this side of the reception desk, where they can discuss the work and handle photographs more freely than they could in front of the desk, where patients may be present. A roentgenographic viewbox is included in this area.

Adjoining the reception area is the filing room for negatives (15 by 27 feet), one end of which is seen in figure 4. These files contain negatives only, as all prints and lantern slides are delivered. More than 400,000 negatives are on file at present. This number includes old nitrate films that are stored in a distant film-storage building because of the fire hazard.

One end of the main studio is shown in figure 5. This room is 11 feet high, 36 feet long and 18 feet wide. The bay at the left provides an additional area measuring 8½ by 17 feet. On the end wall of the studio is a permanently attached black background ruled with white lines to form 6-inch squares. In front of this are several sliding backgrounds that are suspended from plastic rollers on overhead tracks. The most distant of these backgrounds has a facing of cork. The next one is matte black, which is used when photographing patients who have scoliosis and whose spinal columns have been outlined with black grease pencil. The negatives are double printed with grid lines that are on clear film. The next background is clouded and is used when making portrait negatives. The next one is plain white and the nearest one is plain gray. Above and in front of these backgrounds is a recess that conceals a 12-foot roller carrying colored background paper. Finally, there is gray drapery that can be

Figure 4.

Figure 5.

pulled easily to cover the full width of the studio. A similar drape usually is drawn across the bay at the left. The floor is covered with plain gray linoleum.

The overhead lights are reflector lamps that are controlled by a voltage regulator (Colortran) to produce light that has the desired color temperature. These lights, which eliminate the hazard of many wires lying on the studio floor, are used for general illumination when making motion pictures. Additional floodlights and spotlights on floor standards are used when necessary. Other lighting used when making still pictures consists of electronic flash, flash bulbs, incandescent light and fluorescent light. Daylight is no longer used.

In the other end of the studio is a cabinet for supplies, a dressing room for patients, a lavatory and a telephone. The entire section, including the studio, is air-conditioned, with each room having an individual thermostatic control.

Another small studio (fig. 6) is available when the main studio is in use. This 9 by 15-foot room is used most often late in the day when a patient is hurrying to a hospital for treatment or when a dismissed patient is in a rush to catch transportation to a distant home. The rear wall of this room is painted flat white, and there is also a gray background that swings around the corner on an overhead track. This room and all other rooms except the waiting room and main studio are $8\frac{1}{2}$ feet in height.

Adjacent to the reception area is a 9 by 10-foot private office (fig. 7) where the head of the section can confer with staff physicians, salesmen and departmental personnel. Two additional offices, each 9 by 15 feet in size, provide indi-

Figure 6.

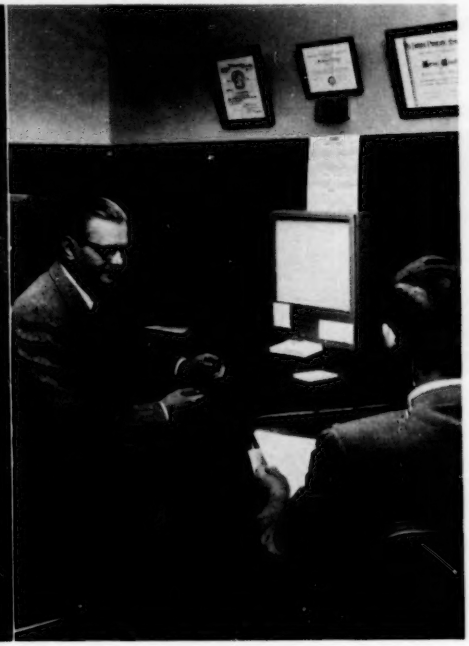

Figure 7.

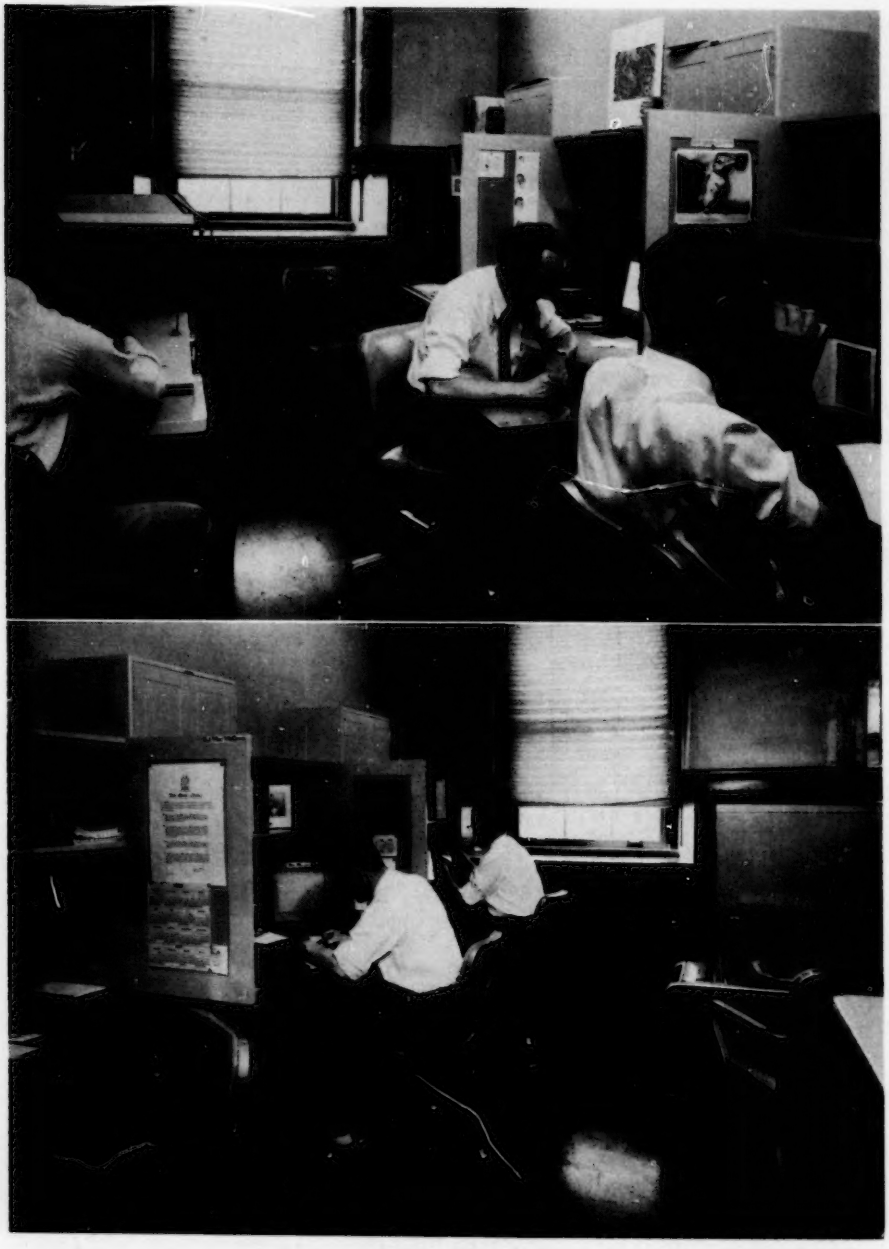

Figure 8.

Figure 9.

Figure 10.

vidual desk space for six members of the section (fig. 8).

A room 14 by 15 feet in area is reserved for photographic copying. One end of this room (fig. 9) contains an electrically driven autofocus camera (5 by 7 inches). Two sources of fluorescent light are controlled by a foot switch, and attached to each light unit is a hinged polarizing filter. On the counter is seen an adjustable bookholder that can be used under the camera. The opposite end of this room is seen in figure 10. The camera on the overhead track remains at a right angle to large pieces of copy material that can be stapled to the cork wallboard. Camera backs of various sizes may be used, the largest being 11 by 14 inches. The adjoining 7 by 8-foot darkroom is used only for processing films that have been exposed in the copying room. Photostatic copying is done in a 16 by 32-foot room located in an older part of the building.

Another room, 9 by 15 feet in size (fig. 11), is used for making copies of roentgenograms. A specially constructed 14 by 17-inch illuminator contains 32 lamps controlled by individual switches. The illuminator box moves freely both laterally and vertically. The camera is on a ball-bearing sliding track and can be moved close to the illuminator to make enlarged copies of a portion of a roentgenogram. The camera has several backs ranging from 8 by 10 inches down to $3\frac{1}{4}$ by 4 inches, the latter being used when making lantern slides. Films and lantern-slide plates exposed in this room also are processed here. Black-and-white lantern slides (except those of roentgenograms) are made in a 6 by 7-foot darkroom (fig. 12) that contains a specially constructed autofocus projection printer.

In figure 13 is seen one of a pair of identical 7 by 8-foot darkrooms used for processing black-and-white films. Color films are processed in a 7 by 10-foot darkroom (fig. 14). Above the left end of the sink is the illuminator that is used for re-exposing the films. On the shelf is an "in-and-out" board that lists each step of the processing procedure. This is a convenience when telephone calls may cause interruptions. Also on the shelf is an electric buzzer that sounds at 1-minute intervals to aid in maintaining uniform agitation of the films during processing.

Contact printing is done in two identical 8 by 12-foot rooms. One of these (fig. 15) contains a large washer for prints that is electrically driven, whereas the other room has a small washer driven by hydraulic power. One end of the stainless-steel sink has a compartment, fitted with a drain, that is used to hold the fixing bath. Above this compartment is a white spotlight operated by a foot switch.

Projection printing is done in an adjoining 8 by 20-foot room. In one end of this room (fig. 16) is equipment for making enlargements and reductions. At the end of the developing counter is a 14 by 17-inch contact printer (Stouffer McIntire) that is used for making contact prints from roentgenograms. The opposite end of the room (fig. 17) contains a print washer 4 feet in diameter.

A well-lighted corridor (fig. 18) adjoining the developing and printing rooms contains a film-drying cabinet, an electric print dryer and a print straightener. A passageway to the right leads to an 8 by 9-foot alcove that is used for mixing chemicals (fig. 19). Two sides of this area contain storage cabinets. A hinged bin under the sink is used for storing sodium hyposulfite in bulk form. Prepared chemicals are dissolved in water

Figure 11.

Figure 12.

Figure 13.

Figure 14.

Figure 15.

in a stainless-steel bucket and carried to the processing rooms, thus minimizing contamination from chemical dust. Each darkroom has supply lines for hot and cold water. However, the cold water is too cold for efficient washing of films and prints, so a thermostatic valve tempers (68° F.) all water that is used for those washing operations. The room for processing color has an additional control unit to maintain the water at a temperature of 75° F. All the processing rooms are painted with washable paint and have wainscot and floor coverings of vinyl.

A number of people in addition to departmental personnel have occasion to mount photographs with a dry-mounting press, so a 6 by 15-foot room has been provided for this purpose (fig. 20). Incidentally, the electric current to all heating and power equipment in the entire section is controlled by a master relay switch located at the departmental

Figure 16.

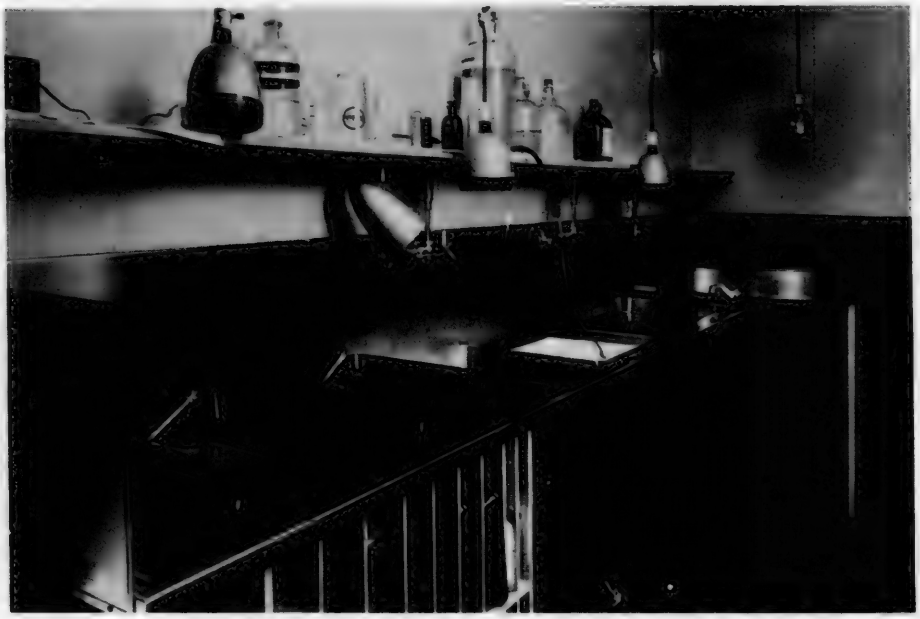

Figure 17.

Figure 18.

exit. The last person departing at the end of the workday turns off this switch.

Adjoining the exit is a 9 by 15-foot room (fig. 21) that contains equipment to be taken out and returned. This consists of projectors, projection screens, cameras, tripods and lighting equipment. A repair bench also is located in this room.

Photomicrography is done in a 9 by 22-foot room (fig. 22) that can be darkened by means of opaque black window shades. Similar window shades also are used in several other rooms.

One room that is extremely useful is a 15 by 19-foot general utility studio (fig. 23) used for photographing miscellaneous apparatus and special setups. Patients are not brought to this room, so it is possible to work here without interruption until a job is completed. This utility studio also contains a stand used in the production of animated motion

Figure 19.

pictures; it also includes a bench with camera and illuminator used when copying color transparencies. A movable stand that is sometimes used when filming surgical procedures is stored here until needed.

A room 16 by 22 feet in area (fig. 24) is used for editing most of the motion-picture films. Four large steel cabinets are used to store several hundred reels of original film and various inactive films. Uncompleted films are also kept in these cabinets and are out of sight of persons who would insist on borrowing them if they saw the labels on the film containers. In an adjoining alcove are open racks of films that may be borrowed. An adjoining lecture room (15 by 28 feet) is shared with another department and is used when showing motion pictures to groups of not more than 35 persons.

The Section of Photography has 14 full-time employees, two of whom are

Figure 20.

Figure 21.

Figure 22.

Figure 23.

Figure 24.

Figure 25.

Figure 26.

assigned to the Medical Sciences Building, where the section has additional facilities. This building is 2 blocks from the main studio, but the buildings are connected by a pedestrian subway. In the Medical Sciences Building, the section has an 8 by 12-foot room in which is mounted a vertical camera used for photographing gross specimens (fig. 25). There also is a 27 by 28-foot space that is divided into several small darkrooms and an open area. One of the darkrooms contains special equipment for processing long rolls of kymographic records (fig. 26), which are dried on a drum type of dryer fitted with a power-driven take-up spool (fig. 27). This area also contains equipment for re-recording sound from magnetic tape to optical sound on film (fig. 28). Both double system and single system are used in the production of sound movies. A sound-proofed studio is not available at present, so filming is done in various parts of the building, usually at night when unwanted noise is at a minimum. Editing of sound film is done in a 10 by 22-foot projection booth (fig. 29).

Figure 27.

Figure 28.

Figure 29.

In summary, the Section of Photography at the Mayo Clinic has approximately 7800 square feet of space assigned to it; 6000 square feet are in the main quarters and the balance is divided among several distant areas. All space is air-conditioned and the quarters are kept immaculately clean by the custodial staff. All this is evidence that the clinic's administrative officers recognize the important role of good photography in the various activities of the institution.

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Simplified Photography of Gross Specimens Using "S-C" Photographic Arrangement

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FOR the past several years, both surgical and autopsy gross specimens have been photographed routinely by Pathologists or by Residents in the Department of Pathology. Prior to this the photography was done by the Medi cal Photographer. Since the Photographiic Department is located on the other side of the hospital and gross specimens are photographed at different times of the day and night, considerable time was wasted in going back and forth. Frequently the Medical Photographer was not available at the desired time because of darkroom work, or because he was urgently needed for photography in the Operating Rooms. Some means had to be found to solve the problem, such as employing another photographer, reducing the amount of work, or giving preference to the Pathology Department.

Hence it became necessary to devise a simple and effective method by which the Pathologist could take his own photographs when convenient for him. The photographic arrangement to be described is simple to operate and will produce 35mm. colour transparencies of high quality, Figure 1. If black and white photographs are desired, they are made from colour transparencies by projection or contact. Pictures of the cadaver and special techniques such as infra-red photographs are photographed by the Medical Photographer.

S-C Photographic Arrangement

The "S-C" Photographic Arrangement is a vertical copying arrangement designed for simplified gross specimen photography, Figure 2. It is located in the Pathology Department. It consists of two lights, a box for supporting the specimen, a vertical support to hold the 35mm. camera, a colour scale and instructions for the photographic procedure. The lights are No. 2 photoflood lamps in 12 inch aluminum reflectors on stands which are four feet high. Each has an on-off switch. The box measures 20 inches in each direction. The top of the box is ¼ inch plate glass, two sides and base is made of ¾ inch plywood and two sides are open for shadowless background. The floor

Figure 1. Photograph made from colour transparencies which were taken by the Pathologist using the "S-C" photographic arrangement.

of the box is covered by blue-green linoleum but coloured cardboard may be inserted for backgrounds of different colours, Figure 3.

The vertical support for the camera is a 1¾ inch pipe over 5 feet long. It is filled with lead to reduce vibration and is mounted 8 inches above the glass top of the box and projects 8 inches from the wall. Wooden brackets support the pipe at both ends. The camera is supported by a connecting arm 10 inches long which can be fixed at any height. A Leica camera body with Visoflex housing, Monobar bellow extension, 135 mm. Hektor F:4.5 lens in short mount is used. A fixed pointer projects from the connecting arm to the colour scale which is painted on the wall. The colour scale begins

Figure 2. Photograph of the "S-C" photographic arrangement.

13 inches above the glass top of the specimen box. The first colour is black and it extends upward for 3 inches, next red for 3 inches, yellow for 5 inches, green for 6 inches and blue for 8 inches. Above this height the scale is gray. At an image to object ratio of 1:1 the connecting arm is at the lower end of the pipe and the pointer indicates the lower border of the black

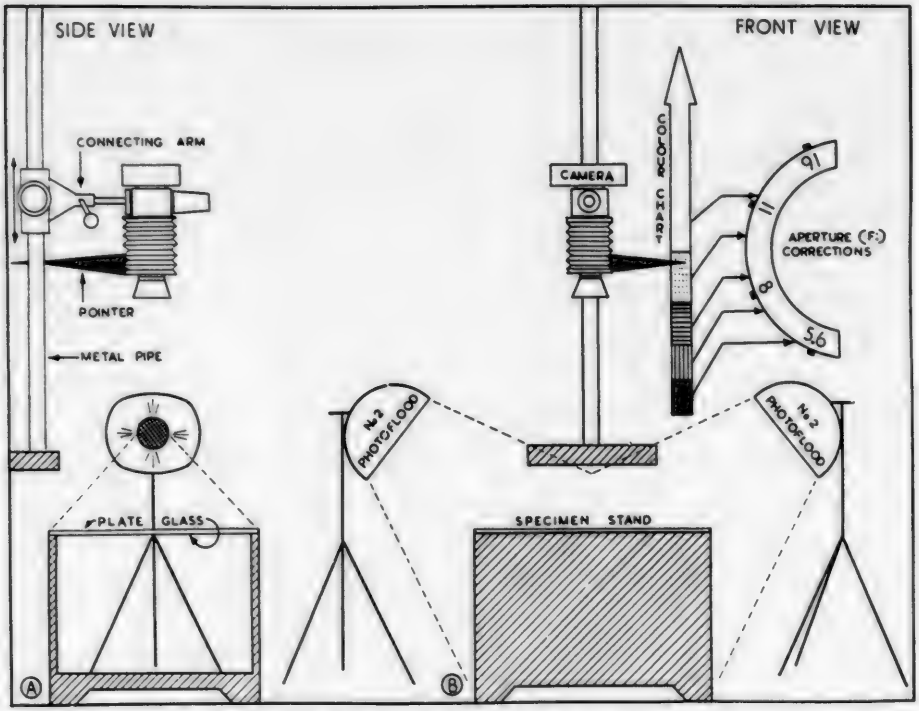

Figure 3. Diagram of the side and front view of the "S-C" photographic arrangement for gross specimen photography.

on the colour scale. The photographic instructions are mounted on the wall nearby.

Photographic Procedure

If the light source, the distance of the light source, the lens focal length, the film and the shutter speed are kept constant, the only variable will be the aperture of the lens. The effective aperture changes when the working distance is less than 8 times the focal length of the lens. Each colour of the colour scale represents a corrected aperture and this aperture is given in the instructions and is shown in Figure 3. These apertures are determined by calculation and confirmed by test exposures. Kodachrome type A film in 36 exposure rolls or Kodachrome type F in 20 exposure rolls with a Kodak Light Balancing Filter (Wratten No. 82A) is used. The camera shutter speed is kept at ¼ (1/5) of a second. If different films, lenses of other focal lengths, other cameras and other light sources are used a different scale of corrected apertures will be necessary.

Instructions

(1) Make certain the glass is clean.
(2) Place specimen in the centre of the glass.
(3) Place scale beside specimen when indicated.

(4) Exclude daylight and turn off room lights.

(5) Adjust aperture (f: number) as indicated by the colour chart after proper framing and focusing.

(6) Make exposure.

(7) Enter exposure number, pathology number, organ and diagnosis in book.

The maintenance of the equipment, film-changing, development, mounting and filing is carried out by the staff of the Photography Department.

The "S-C" photographic arrangement has been used in St. Michael's Hospital for the past 4 years and has proven itself very satisfactory and it has been adopted by other institutions.

ACKNOWLEDGMENT: to Dr. R. C. Ross, Pathologist, St. Michael's Hospital, for the photographs in Figure 1.

"*Let us now praise famous men . . .*"

The physician knows of Galen and takes the Hippocratic oath. The architect starts by learning the classic orders of columns. The lawyer goes back to Rome for the origins of the profession he practices.

All too often, unfortunately, the photographer picks up his knowledge of the processes currently most commonly in use at the time he first clicks a shutter. He does not trouble to enquire into the joys and frustrations which accompanied the endeavours of that army of diligent workers, both amateur (and in the early days so many of them were) and professional who made the succession of discoveries and inventions which enable him today to click his shutter and, after disappearing from public view for a while, to reappear with a reasonably faithful record, in full colour, of what was before his camera when he chose to expose his material. We feel that some appreciation of the limitations under which the early photographers worked would give the photographer today a better understanding of the materials which he handles with such nonchalance and, regrettably, all too often takes for granted.

From time to time it is said: "Nothing is new . . . " Well, it must have been once, but when? In 1881 C. J. Breton tried using a selenium cell for releasing his camera shutter and simultaneously adjusting the exposure time. Twenty years earlier Clerk Maxwell established, and demonstrated, the principles of substractive colour photography; and about twenty years before that David Octavius Hill and his chemist assistant Adamson took a vast series of portrait photographs which, recognizing the limitations of Fox Tabbot's Calotype process which they used, for artistic conception, composition and taste have hardly been rivaled since.

An historical approach to our much-vaunted medium, we have no doubt, would result in a commendable humility in the face of the debt we owe our predecessors for the results which we are enabled to produce today. Their example might instill more of that patience and meticulous care which are essential to the best handling of the materials which we have on our shelf — *our* inheritance of *their* devotion and ingenuity.

TONY GRAHAM

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A Copy Camera Stand Made From Surplus X-Ray Equipment

LOUIS A. FACTO

Journal Paper No. J-3489 of the Iowa Agricultural and Home Economics Experiment Station, Ames, Iowa. Project No. 104.

MANY copy camera arrangements are inefficient in that the operator must constantly adjust both camera and copy before an exposure is possible.

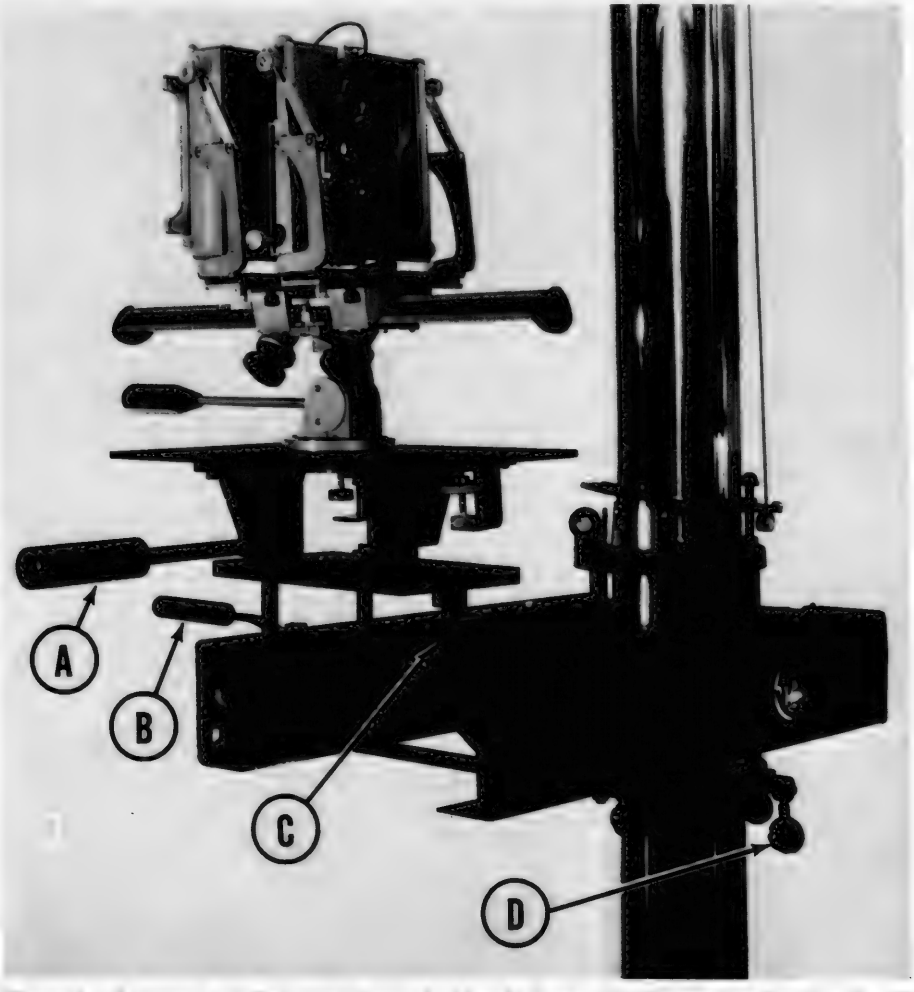

Figure 1. A close-up of the camera mounting head shows: (A) Camera leveling handle, (B) Horizontal travel lock and, (C) Leveling adjustment, (D) Vertical travel lock.

A
B
C
D
E

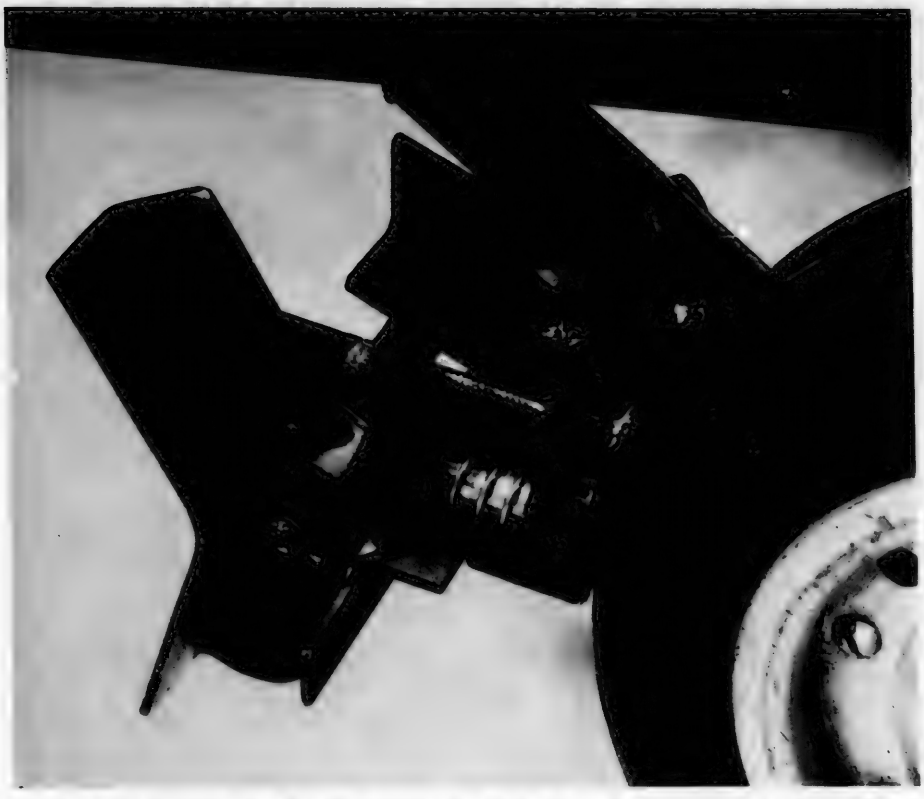

Figure 3. A positive lock for the wheeled base was of prime importance. A spring loaded pin actuated by a foot operated cam solved this problem.

Figure 2. The camera stand ready for use. The necessary modifications to the original equipment are indicated as follows: (A) Provide mounting head for cameras, (B) Install a positive horizontal travel lock, (C) Extend horizontal travel channels six inches, (D) A fifty pound counterweight was substituted within the column in place of original spring tension arrangement, (E) Install positive lock on wheeled base.

These adjustments of the groundglass and copy board involve a great deal of walking and a lot of time. Several types and makes of X-ray stands are now available in surplus markets that make efficient copy camera installations possible.

The problem of efficiency revolves around the idea that once the copy is placed on the board, the remaining adjustments can be made while viewing the image on the groundglass.

By modifying a surplus Keleket X-ray stand, a copy camera stand was produced that was efficient and contained many advantages. These advantages include such features as:

1. Several types of cameras may be mounted ranging from 35mm. to 8 x 10 in size.

2. Simple adjustments insure that the optical axis of the camera is perpendicular to the copy board.

3. Positive locks insure rigidity in all positions.

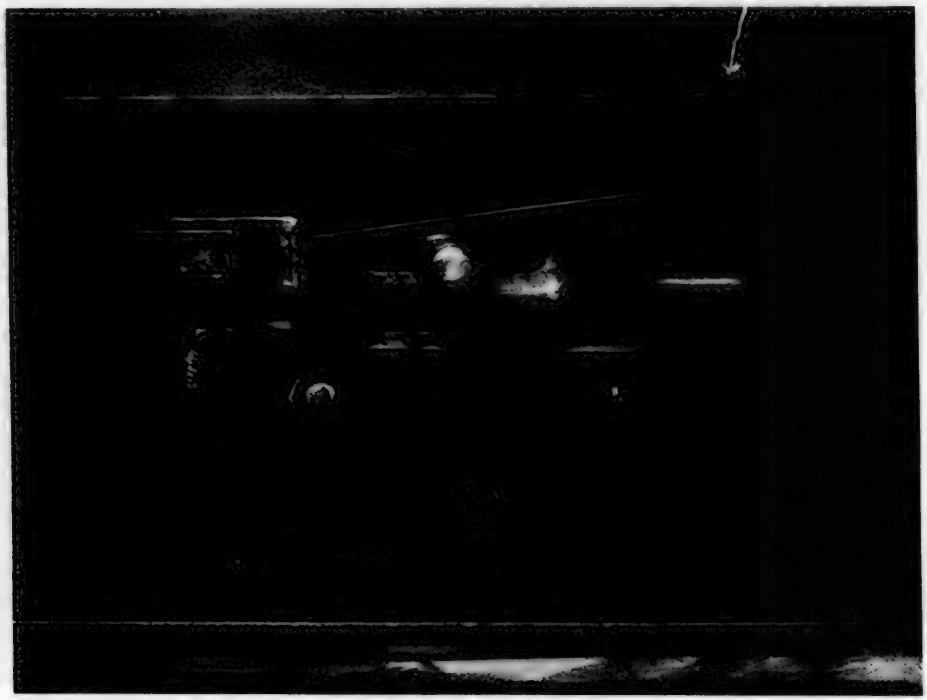

Figure 4. Cam operated locks do not solve all locking problems. In the case of the horizontal travel carriage, a wedge actuated pin served the purpose. These two adaptions of locking innovations plus others can be devised to add stability to other similar applications.

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Stereo Macrophotography of Biological Material

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ALTHOUGH stereophotography has been extensively used in the taking of "scenic" subjects for years, it is now gaining increased recognition as a valuable medium in the fields of visual education and research. It would seem, however, that its application in extreme close-up photography is not fully appreciated. This is probably due to the incorrect impression that stereo macrophotography is impractical and uneconomical because of too many technical difficulties, necessitating the use of specialized equipment. These arguments are not valid when the definite advantages of realism and contour provided by macro stereos are considered, particularly as applied to biological research and identification.

This paper will describe a technique for taking stereo photographs of botanical and entomological material in the macro ranges, using a single lens reflex camera in conjunction with a stereo track.

General Considerations

Vierling[1] discusses the factors at the photographer's disposal which create the illusion of depth, such as perspective, illumination and color. But as the eyes transmit two distinctively different images to the retinas, which are fused into a three-dimensional image in the brain, it obviously follows that the only way to obtain this condition photographically is by producing two pictures of the same scene, each photographed from a different point.

In stereo, one basic fact must be borne in mind, and that is, the impression of *space* must be maintained. This impression is dependent on the following points. Each image should be taken to convey a different perspective to the eyes, as occurs in normal vision. The images should be taken at two points which should equal the interpupillary distance, usually 62 mm. (A greater separation will result in a distorted illusion of depth. However, with close-ups, the normal distance must be reduced to counteract the exaggeration which would otherwise occur.) Finally, each image should be conveyed to the eyes both vertically and horizontally aligned.

Preparing the Subject

When working with live entomological specimens which require exact positioning to show particular scientific features, some method must be found to maintain the subject in a stationary position. This is certainly true in ordinary close-up work but is of the utmost importance when taking stereos because of the two exposure technique required. If the material can be killed and mounted and

still retain the desired characteristics (Fig. 3) or is satisfactory in its natural state (Figs. 4 and 6) then no problem exists. But, if the subject must be maintained alive for further study or development (Fig. 5) then some method is required to suspend its activity during photographing, without damage or alteration. It has been mentioned[2] that chilling in a refrigerator is effective, but the placement of appendages is sometimes quite difficult and the effect of chilling sometimes dissipates rapidly at room temperature. Carbon dioxide has been used by the author for hard bodied insects such as beetles, which leaves the specimen in a relaxed condition. Killing of larvae usually results in unnatural appearance and, what is more important, rather rapid color changes. This not only ruins the specimens, but also renders the photograph useless as a control or check for further studies. If the specimens must be kept alive, then carbon dioxide is recommended, but this usually results in making them sick which means more time required for preparation. A good method, if the larvae can be killed, is to immerse them in warm water for periods of up to one-half hour. This maintains them in easy handling condition without affecting the natural color of the specimens.

Taking Stereo Macros

As Connolly[3] remarks, most biological specimens, because of size requirements, dictate lens of subject distances much less than those allowed by the commonly used two lens stereo cameras. He also outlines a procedure for stereo photographs using a single lens camera, but appears to have limited the working distance to about twenty inches.

As mentioned, 62mm lens separation is required between exposure positions for general stereo work, but in close-ups this distance obviously would not be suitable. The required second exposure would probably fail to include all of the subject covered by the first frame, as it would be outside the range of the lens (depending on the magnification). Another point which must be considered is that the eyes cannot comfortably accept an object at extremely close range. The same holds true for macro stereos. Therefore the photographs must make the subject appear to be at a reasonable viewing distance from the eyes. This is accomplished by reducing the distance between the two lens positions to something much less than 62mm. This separation depends on the reduction or magnification required.

The "required separation" distances, Table 1, are computed from the equation[4]:

$$\frac{\text{normal eye separation}}{\text{apparent distance}} = \frac{\text{required lens separation}}{\text{subject to lens distance}}$$

Table 1.

CAMERA SEPARATION DISTANCES		
APPARENT DISTANCE—3 FEET (914 MM)* 50 MM. LENS		
REDUCTION OR MAGNIFICATION	SUBJECT TO LENS DISTANCE IN MM. †	REQUIRED SEPARATION IN MM.
0.1	550	37.3
0.2	300	20.4
0.3	217	14.7
0.4	175	11.9
0.5	150	10.2
0.6	133	9.0
0.7	121	8.2
0.8	113	7.7
0.9	106	7.2
1.0	100	6.8
1.2	92	6.2
1.4	86	5.8
1.6	81	5.5
1.8	78	5.3
2.0	75	5.1
2.2	73	5.0
2.4	71	4.8
2.6	69	4.7
2.8	68	4.6
3.0	67	4.5

* *To convert inches to millimeters, divide by 0.03937.*
† *From Berkowitz.*

and are mathematical only. They should be used only as guides, as a better result from a particular subject may be achieved by giving slightly more or less separation than indicated in the table. In addition, the specifications are based on an "apparent distance" of three feet (914mm). This distance is purely arbitrary and is dependent on the subject size and distance, as well as personal preference.

Figure 1 illustrates the camera set-up for photographing the stereo-pairs shown. These were photographed with an Exakta IIa and a 50mm f/2.8 Tessar lens. Lighting was supplied by an Ascor Speedlight 400 Series, Model 200M, with the lamp head fifteen inches from the subject. Desired magnifications were obtained by the calibrations on the vertical track of the Kilfitt bellows extension. The horizontal track is marked for the standard lens separation required for normal stereo photographs. With macros, the left-hand marking can be used first and lined up with the track sleeve on the camera mount. The first exposure is made, the required separation is measured to the right, the sleeve is racked to this position, and the second exposure is made. It makes no difference which "eye" is exposed first, but the method should remain consistent; otherwise, difficulty will be experienced in mounting a sequence of several stereo-pairs.

Figure 1. Camera set-up.

Illustrations

All original stereos were taken on Ektachrome film, Daylight Type, (ASA 32) and the following exposures apply to this material. The reader will immediately notice that one image in each pair is reversed. Needless to say, this placement is not used when mounting the transparencies for standard viewing. However, to make the illustrations more interesting, they are layed out in a position which will render a three dimensional image by the use of a mirror. The pairs may be viewed by holding a purse size mirror to the right side of the nose with the reflecting surface facing toward the right. By positioning the head directly over the illustration, (Fig. 2) and tilting the mirror back and forth until the right hand image is superimposed over the left, a three-dimensional picture will be seen.

Fig. 3—A portion of the lower surface of the wing of a Glaucon Blue butterfly, *Philotes glaucon*. Magnification 3:1 on the film, exposure f/8, lens separation 4.5mm.

Fig. 4—Needle Miner damage on Eastern White Cedar, *Thuja occidentalis* L. Magnification 2:1, exposure f/8, lens separation 5.1mm.

Fig. 5—Head portions of larvae, *Heliothis punctigera*, commonly called Corn Ear Worm. Photographed at 1:1, exposure f/16, lens separation 6.8mm.

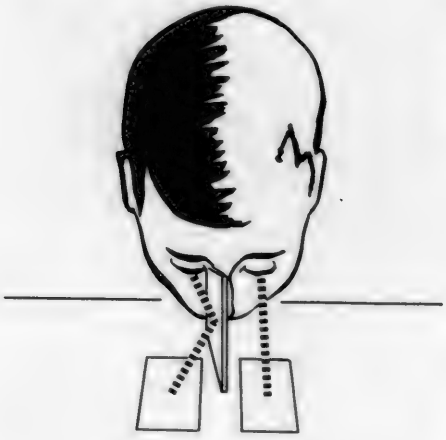

Figure 2. Position for viewing three-dimensional picture.

Fig. 6—Early stage pigmentation of the lower surface of a leaf, *Chenopodium amaranticolor*. Photographed at 1:1. Exposure between f/11 and f/16, lens separation 4mm. The lens separation of 6.8mm actually specified for this magnification was found to give an exaggerated illusion of depth with this particular subject; hence the use of only a 4mm separation, which made the subject appear more "normal".

Mounting

In mounting the finished transparencies it has been found best to simply "register" the stereo-pairs and cut off the ends of each to the required width, depending on the size of mount used. Of course you cannot register two photographs which were taken from different points, but if the images are superimposed as closely as possible and the two frames are kept in vertical and horizontal alignment good stereo effect will be achieved. It is also important that each transparency be mounted in the correct position for viewing with the eye for which it was taken.

If stereomounts with a 23 x 24mm opening are used, the frame size will obviously be smaller than the usual 35mm format. This should be kept in mind when positioning the subject in the viewfinder, unless it is equipped with a reducing mask. Another important point is that the lens separations, although obtained from the table, will sometimes move part of the subject beyond the frame edge. This happens if a particular magnification is required for a certain area of the subject, which fills the frame opening. When the frames are superimposed for mounting, part of the subject will extend beyond the edge of the mask. In each case, either the magnification must be limited, reducing the image size, or the framing must include a smaller portion of the subject. The pairs are viewed in a standard hand viewer.

Acknowledgement

The author wishes to thank G. H. Parker, Head, bio-Graphic Unit, for his valuable help in preparing this paper.

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Fig. 3

Fig. 4

Fig. 5

Fig. 6

Journal of the Biological Photographic Association Vol. 26, No. 3 August, 1958

A Simple Plastic Mount for Lantern Projection of Color Transparency Photographs

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IT was thought that the following account of the advantages of a method for mounting color transparencies for lantern projection may be of interest to others. The weight of the standard glass projection lantern slide is a problem of constant travel inconvenience. In this laboratory the Polaroid Slide Mount #632 consisting of two sturdy, lightweight plastic interlocking frames obtainable from the Polaroid Company, Cambridge, Massachusetts, was found to be suitable for color transparencies to overcome the excessive weight of glass. The outside dimensions of the mount are standard 3¼ x 4 inches in size, with a window opening (mask) of 2½ x 3¼ inches. The total weight of the finished slide mount is only 12 grams, as compared with 48 to 50 grams for the ordinary glass mount. The transparency is first placed in the protective cellophane sleeve and trimmed to proper size, then placed between the two plastic frames which are snapped together. The transparency is now masked and firmly locked between the two frames, ready for projection. No binding is necessary. As a test, a lantern slide of this type has been projected with the temperature at the slide holder at 47° C. for fifteen minutes with no buckling or damage of the transparency. The heat is dissipated very rapidly from the slide after removal from the projector. The frames can be easily dismantled and reassembled, thus necessitating only a minimum number of slide mounts to be carried for any given lecture. The dismantled transparencies can be filed in their envelopes in a very much smaller space. The Polaroid Slide Mounts are inexpensive and available through most photographic shops.

[1]National Institutes of Health, Public Health Service U. S. Department of Health, Education, and Welfare.

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A Simplified Technique for High Speed Flash Photography with the Phase Microscope

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THE rendition of sharply defined edges free from disturbing fringes is one of the distinct advantages of the phase microscope. However, in many colloidal systems the size of the particle is such that "Brownian" motion is present.[1] Measurement of particle sizes in this case is difficult or at least unsatisfactory. Apparatus and techniques are described elsewhere[1] for the photography of such samples but call for special electronic flash tubes and optical setups.

The following commercially available equipment has been successfully used with the American Optical "phase" microscope for making "electronic" flash photomicrographs:

American Optical Advanced Illuminator No. 135

Strobonar 1a or 1 Flash Lamp*

Leica Camera and Micro-Ibso Attachment

Neutral Filters, Inconel Coated Glass**

Procedure

The simplicity of the techniques is due to the fortuitous construction of the "advanced illuminator" which allows the separation of the lamp housing from the lens system by loosening two thumb screws. When taking the "flash" pictures, they are left loose enough so that the lamp housing can be lifted off without disturbing the position of the light. An appropriate field is located by means of the focusing telescope of the Micro-Ibso and the flash lamp placed in position after the removal of the regular light as shown in Fig. 1. At the extreme left of the photograph is the regular lamp of the illuminator. Next the power pack and the flash lamp is shown in position being held by a clamp supported by a ring stand. In actual practice the flash lamp can be "hand held" in position. As shown in the illustration, the shutter of the Micro-Ibso is used to discharge the flash. Equally satisfactory exposure may be made by opening the shutter and operating the flash manually. Exposure is controlled by use of the appropriate "Inconel" neutral filter. As a guide, satisfactory negatives were made with the new Eastman Panatomic X film with the oil immersion N.A. 1.25 bright contrast-high objective. No filter was used and the ground glass diffuser of the illumination was left in

*Supplied by Heiland Research Corp., Division of Minneapolis-Honeywell Corp.
**Supplied by Bausch and Lomb Optical Co.

Figure 1. Strobonar 1α in position for taking flash photomicrographs. Note regular light source at the extreme left of the photograph.

position. Normal development of the negative in D76 was used, although greater contrast could be gained by increasing development time. The system could easily be made more elaborate by mounting the two light sources on a sliding bar or by using a flash tube with a "modeling light" for focusing. Shorter flash duration or greater light output could also be used by changing the type of flash tube and power pack which is available.

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A Platen for Cleaning Lantern Slide Cover Glass

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Nashville 5, Tennessee

IN this electro-dynamic age in which we find ourselves a part, I am introducing a new mousetrap idea to brighten your world of lantern slides.

Any lantern slide, worth the time to prepare, is also worthy of a clean cover glass. The menial task of cleaning cover glass is time consuming and often omitted as a result.

A lucite platen, approximately 8″x15″x½″, is used because it will not warp, cleans easily and can stand abuse. (Figure 1) A recessed area, the size of a lantern slide cover glass and containing a cutout for finger, can be accomplished by using a steel file, wood rasp, razor blade, wet sandpaper or by many other methods including a bench saw.

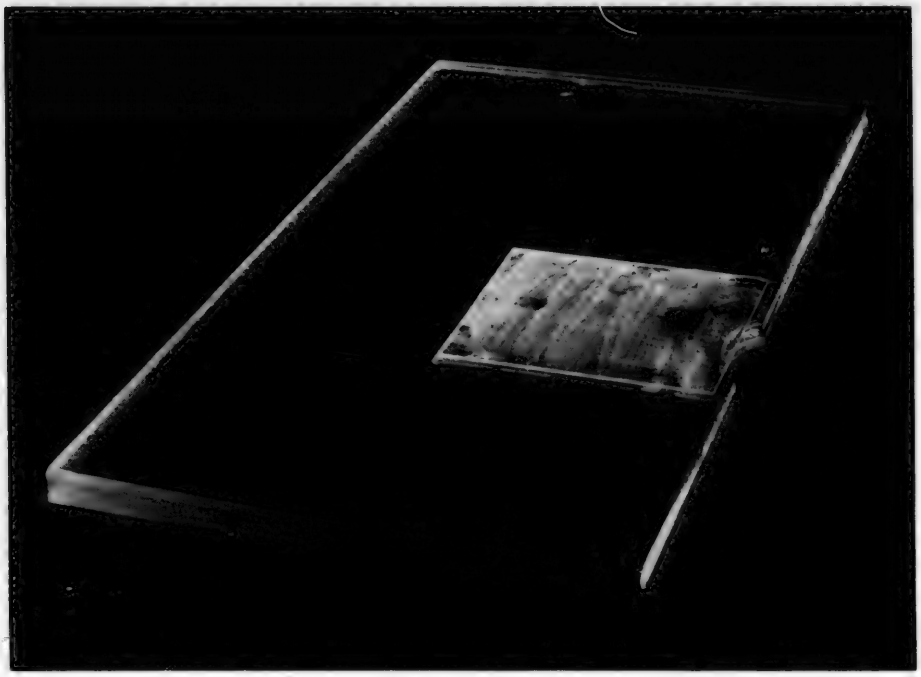


Figure 1

By placing the unclean cover glass in the recessed area and swabbing cleanser across the surface with a few swift strokes and flipping over the other side for the same treatment you coat the glass and at the same time clean it. If you use a paste or powder cleanser, stand slides in drying rack until about two dozen are coated. Repeat the process to polish. By holding the two dozen glasses together the edges may be wiped clean in one operation.

A creasing block, made of 3″x4″x½″ lucite or wood, with ⅛″ groove the length of it can be used for binding lantern slides on the reverse side of platen. (Figure 2)

This platen can also be used in reclaiming old discarded lantern slide plates for use as cover glass after several days soaking in tray cleaning solution.

Many people have left their mark in this world, especially lantern slide projectionists. These fingerprints can be removed by placing slides in recessed area in platen and swabbing with moist, not wet, cloth.

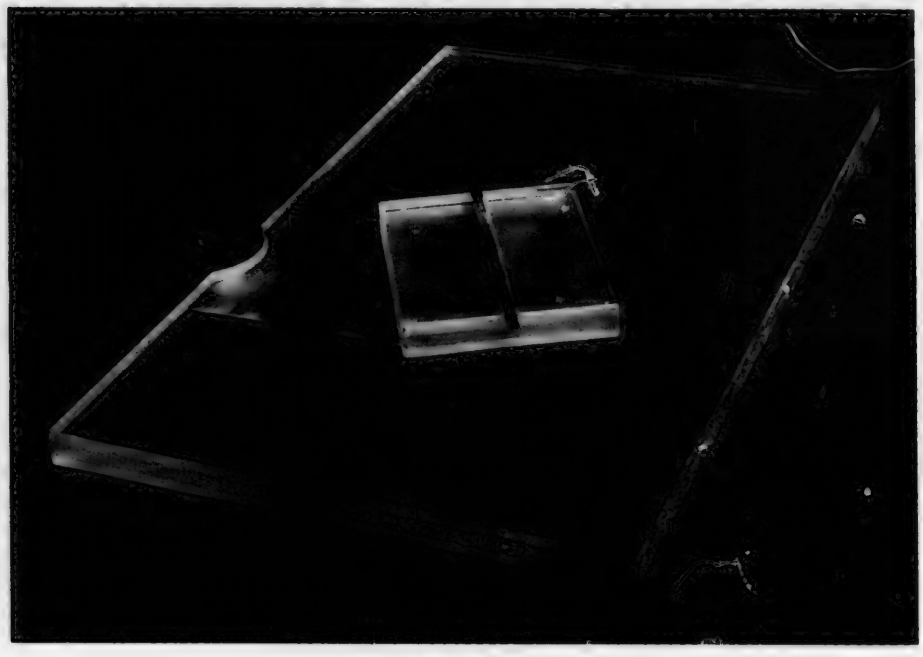


Figure 2

BOOK REVIEWS

CONCEPTS OF CLASSICAL OPTICS, *John Strong, W. H. Freeman and Co., San Francisco, xvi+692pp, 414 figures, 1958. $9.50.*

Light, wave motion, electromagnetic waves, interaction of light and matter, scattering, polarization, double refraction, interference, Fresnel and Fraunhofer diffraction, coherences, images, magnification, aperture and field are the main areas of the first half of the book. The remainder consists of short appendices on topics of current interest such as interferometry, Köster's double-image prism, modern concepts of light, microwave analogies, lens design, filters, fiber optics, gratings and a mathematical review, by experts working in these fields: Dyson, van Heel, Kapany, Williams and others. Problems are given for each chapter and there is an index. The book is intended for an intermediate course in optics and some knowledge of calculus and complex numbers is assumed. For those no longer in college it will be advanced, but rewarding in broad coverage and modern orientation and outlook.—O.W.R.

ANTONY van LEEUWENHOEK AND HIS 'LITTLE ANIMALS': BEING SOME ACCOUNT OF THE FATHER OF PROTOZOOLOGY & BACTERIOLOGY AND HIS MULTIFARIOUS DISCOVERIES IN THESE DISCIPLINES, *by Clifford Dobell. Russell and Russell, Inc., New York 3, N.Y. 435 pages. 1958. $10.00.*

Leeuwenhoek, a draper by trade, chamberlain at the town hall of Delft, and surveyor, made simple microscopes with his own hands, discovered microorganisms and reported his discoveries in odd letters to the Royal Society in the 17th century. Toward the end of the century he was about the only active microscopist in the world. For many years people have heard of his discoveries. Fortunately Dobell was so intrigued that he has spent many years time accumulating the information now available in the book. First published in 1932, it was soon out of print and only this year a new printing makes it again available.

Leeuwenhoek (pronounced Lay'wenhook) driven by curiosity taught himself to grind lenses and to use them to look at about everything he could get in front of his lens. Pepper water was a rich source of microorganisms, and he looked at bits of muscle, sand, and showed many persons the circulation of blood in the tail of an eel. He devised a micrometer system in terms of millet seed, sand grain, vinegar eel, and red blood corpuscles. His finest observations were made by his secret method. To supplement his poor drawing ability he hired draughtsmen.

Dobell includes an introduction on Leeuwenhoek's life and information about the times, language, instruments as well as giving many of the letters of original observations. No one with a tiny interest in microscopy or people will fail to enjoy this book!—O.W.R.

THE MERCK MANUAL OF DIAGNOSIS AND THERAPY, *Charles E. Lyght, Ed. Merck & Co., Rahway, N. J. 9th ed, 1780 pages. 1956. $6.75.*

Much has happened since the first edition in 1899 of this compendium. Part I consists of 20 sections related to a disease group, anatomic region or specialty and part II presents practical features on clinical bedside nursing, laboratory, immunization procedures and diets. It includes many tables, summaries and sketches and is well cross indexed. While this book is intended as a pocket guide for doctors, the medical photographer will find it an excellent source for information about diseases and procedures he may be called upon to record photographically and it will answer many everyday questions about various diseases. It is recommended for the reference shelf within the photographic department. — O.W.R.

AMA Award for Photography

The first special certificate for photography in the Scientific Exhibits at an annual meeting of the American Medical Association was awarded at the meeting in San Francisco in June 1958.

The recipients of the award were BPA members Fred W. Kent, James A. Kent and Jack Davis of Iowa City, Iowa. The competition is open to any exhibitor and is not limited to members of the BPA. The award, which will be presented each year by the AMA, was on the basis of effective use of photography in presentation of medical information. The photographs appeared in an exhibit entitled "Ulcerative Colitis" and the authors were J. A. Clifton, R. C. Hickey, G. H. M. Thornton, and R. T. Tidrick.

This exhibit contained a large variety of photographs that told the medical story with a minimum of legends. Both color and black and white prints were used. The two side panels in the booth each had an opening through which could be seen a series of photographs that were mounted on discs that could be revolved by the viewers.

There were several other exhibits that contained a large number of photomicrographs of very good quality but these were made with standardized set-ups. These were collections of teaching material and did not tell a story so they were not judged. Two of the judges were from the Veteran's Administration so none of the V. A. exhibits were considered. The members of the judging committee were: Leonard A. Julin, Chairman; Louis Paul Flory and Hal M. Strong. L.A.J.

Association News

● *A section of the Journal devoted to official announcements, chapter events, and other matters of historical significance to the Association.*

General News

The 28th Annual Meeting of the Biological Photographic Association was held at the Shoreham Hotel in Washington, D.C., August 18-21, 1958. Capital Chapter was host and there was a record registration of 263. There were two business meetings, an excellent scientific program including two workshops, and a day at Walter Reed Army Medical Center where the official luncheon was held. The meeting concluded with the traditional Eastman Cocktail Hour and the banquet. The meeting was unanimously voted as super-excellent.

It has been requested by the chapters that a summary of the activities of the National Association be made available to those members who do not attend the Annual Meeting. The major part of the Bulletin will, therefore, be devoted to Association Business transacted at the Washington meeting.

Total membership in BPA is 764. This is a net increase of about 150 members in the last ten years. There are 22 sustaining members and 106 contributing members. Total number of paid up subscriptions to the Journal is 306.

There was an election of officers:

President . . . Leo C. Massopust, Sr.
Vice-President . . . Verlin Yamamoto
Secretary . . . . . Jane Waters
Treasurer . . . . . Albert Levin

Three new Directors were elected: Lardner Coffey of Rochester, Minnesota, Julius Halsman of Washington, D.C. and Charles Hodge of Montreal, Canada. Mr. Massopust is also our new Journal Editor and as such we really owe him a vote of thanks for his tremendous effort to get out No. 4 of Volume 25 before the Annual Meeting. This was done practically from a hospital bed. We are glad to report that both Mr. Massopust and the Journal are on the up and up. Articles are desperately needed to fill the February, May and August issues for 1958. Papers from the recent meeting cannot be used until these are completed. You can really make a major contribution toward bringing your Journal up to date by sending an article to the Editor *now*.

Annual Meeting places have been set through 1962 as follows:

1959 Montreal, Canada
1960 Salt Lake City, Utah
1961 Chicago, Illinois
1962 San Francisco, California

The third week of August was voted as the most desirable time for the Annual Meeting, and this will be adhered to whenever possible.

There are 19 Committees of the BPA. The chairmen are appointed by the President except in a few special cases where the succession is automatic. One new Committee was created this year: the Armed Forces Liaison Committee. The list of Committees follows with the new chairman and a brief summary of the report as given at the Annual Meeting by the past chairman.

1. **A.M.A. Council on Scientific Assembly Liaison:** Leonard Julin.

This Committee was asked to inspect and judge the scientific exhibits at the 107th Annual Meeting of the American Medical Association. The Award went to Fred Kent, James Kent and Jack Davis of Iowa City for their exhibit "Ulcerative Colitis".

2. **Armed Forces Liaison:** Capt. Stephen Dittmann.

This is an attempt to establish a closer liaison between the BPA and the Armed Forces. Should we be involved in another war this would be of vital significance to our national security and to BPA members who would be called on to serve in the military. It will also be effective in securing assignments in line with a member's qualifications. Anyone contemplating entering the Service or even being reactivated should contact Capt. Dittmann.

3. **Best Journal Paper:** Ferdinand R. Harding.

The best paper published in the Journal dur-

ing the current year is selected for an Award. David Lubin, V.A. Hospital, Bronx, N.Y. was the recipient for 1957.

4. **Biological Liaison:** Dr. Oscar Richards. (No report)

5. **Chapters:** Laurence B. Brown.
Eleven out of eighteen active chapters were represented at the Chapters Meeting. There were four major suggestions:

a. Technical data should be put on salon prints and transparencies. A corner mount was suggested.

b. Condensed reports of the various BPA Committees should be included in the Bulletin and ultimately in the Journal.

c. Judges of salons should make known their method and should give the reason for rejection when this occurs.

d. Programs from the Annual Meetings should be taped and made available to the Chapters for local presentation.

The first two suggestions are being carried out by the Chapters Committee; the third is well covered in an article in No. 4 of volume 25 of the Journal written by the judges of the Salon in Rochester, Minnesota in 1957; and the fourth will be carried out by Jack Fason who has generously offered to tape three papers and the Salon judging from the recent Annual Meeting. Three copies of each paper will be made and will be available to the chapters at a nominal cost sometime in November.

6. **Electronmicroscopy Liaison:** Dr. Stanley Weinreb.
An effort is being made to secure the cooperation of manufacturers of photosensitive materials in producing a product specifically for the electron microscope. Cooperation has not been good but one manufacturer has now agreed to supply some samples for testing.

7. **Fellowship:** Warren Sturgis.
Five new Fellowships were awarded: Dr. Arthur D. Bensusan, Capt. Stephen Dittmann, Charles E. Engel, Charles P. Hodge and Howard E. Tribe.

8. **Historical:** Stella Zimmer.
Valuable historical material relating to BPA is being collected and classified.

9. **Insurance:** Maria Ikenberg.
A very desirable insurance plan is available to members of the BPA. It is comparable to plans offered to physicians and surgeons and should seriously be considered by anyone who does not already have adequate or satisfactory insurance.

10. **Motion Pictures:** James Rothenberger. (No report)

11. **Nominating:** Mervin LaRue, Jr.
This committee presents the slate of officers to be voted on by the members of BPA. New officers are listed on page 1.

12. **Permanent Print:** H. Lou Gibson.
There are two sections of this collection each consisting of 42 prints. They have recently been exhibited in Milwaukee and Denver.

13. **Recommended Practices:** Warren Sturgis.
The standard operating procedure of every committee of BPA is being written out.

14. **Schmidt Award:** Lloyd Varden.
This Award honors anyone who has made an outstanding contribution to biological photography and it need not be a member of BPA. This year it was given to Albert Levin, our National Treasurer.

15. **Scientific Exhibits A:** Thomas S. Masterson.
An exhibit entitled "Medical Photography: An Aid to Medical Education" was prepared for the June 1958 meeting of the A.M.A. This exhibit was awarded the Certificate of Merit for its excellence. A second exhibit "The Scientific Exhibit: An Aid to Medical Education" is being prepared for the 1959 meeting of the A.M.A.

16. **Scientific Exhibits B:** L. Paul Flory.
"Effective Illustrations for the Oral Paper" was shown in eight cities from September 1957 through May 1958. "The Preparation of Photographs for Publication" was shown in nine cities during the same period. Shipping costs for both exhibits have been paid by the Veterans Administration.

17. **Standards:** Harold C. Baitz.
There are several basic questions which must be answered before meaningful standards can be set up. One is to establish a definition of a "medical photographer". The Committee has suggested: "A scientific illustrator who uses photographic equipment, materials and techniques primarily or exclusively in the planning, design, production and utilization of visual or audio-visual media for the purposes of communication, recording and research in medical or allied fields".

18. **Suggestions:** Howard Tribe.
All suggestions received from members have

been acknowledged and brought to the attention of the Board. A resume has been sent to the Journal for publication.

19. **Travelling Salon:** Chester Reather. The Salon this year was open to Chapter as well as National members and resulted in double the usual number of entries. 150 prints and 148 transparencies were accepted.

CHAPTERS

Boston: The first meeting of the season will be on October 21st. We had seven members at the Annual Meeting in Washington. Mr. Harding and Mr. Withee gave a joint paper on "Techniques of Reproducing 35 mm. Transparencies". The chapter tried a different system on exhibiting prints this year and it worked very well. Prints were collected from members throughout the year and a local Salon held. From these prints twelve were chosen to be submitted to the National Salon. These prints were packaged and mailed at the expense of the chapter. All entries were accepted and two won awards.

So. California: There was a special meeting in July in connection with the Society of Photographic Instrumentation Engineers. Lloyd Matlovsky spoke on LogEtronics and F. Alton Everest on supplemental lenses. A regular chapter meeting was held in September at the UCLA Medical Center Building. Tom Masterson and Bill Martinsen reported on the Annual Meeting. Lloyd Matlovsky spoke about the results of investigation of Arriflex motion picture equipment when first procured in 1943 as a part of captured enemy equipment. Clifford Sawyer discussed and demonstrated the new Beseler Slide O Film.

Chicago. The September meeting was held at the University of Illinois College of Medicine. Thirteen members were present at the Annual Meeting and they gave a report of the activities. This chapter bid for the 1961 Annual Meeting to be held in Chicago and they were accepted.

Central Indiana: First meeting of the season was held at Indiana University. Robert Albright gave a comprehensive report on the Annual Meeting. John Ridgely of Eastman Kodak then gave a talk on the processing of Ektacolor paper.

New York: New officers of this chapter are:

Chairman . . . . . Donald Wong
Vice-Chairman . . . Phillip Oppleman
Sec.-Treasurer . . . . . Mary Mason
445 W. 23rd St., New York 11, N.Y.

The September meeting was held at Olin Hall in New York City. There was a business meeting, reports on the Regional Meeting in Albany and the Annual Meeting in Washington, and two films were shown.

Prairie: The September meeting was held at the new Veterans Administration Hospital in Topeka, Kansas. There was a tour of the laboratory and then a business meeting. It was voted to prepare an exhibit for the American National Veterinarian Medical Association Meeting in Kansas City in 1959. Slides and prints made by members during the summer were shown as well as a prize-winning motion picture.

St. Lawrence Valley: First meeting of the season was held in September at the Montreal Neurological Institute. The Washington meeting was discussed and basic plans for the 1959 meeting in Montreal were considered.

Wisconsin: This chapter was the guest of Line Materials Industries in Milwaukee for the September meeting. There was a tour of the plant and a discussion of the motion picture facilities. A film was shown which was made by this Company "Let There Be Light".

The Chapters Committee wishes to thank the chapters who have been cooperative throughout the year and who were present at the Committee meeting in Washington. Your news makes this Bulletin possible and your ideas make the progress essential to any Committees function. The secretary of every chapter is a member of the Committee and the more active a part you take the better we will like it.

Laurence B. Brown, *Chairman*
Chapters Committee

New Products

ROBOT SPRING BOOSTER MOTOR . . . EXTENDS AUTOMATIC OPERATION

This compact and lightweight accessory, built in the form of a pistol grip, increases the film transport capacity of the ROBOT automatic 35mm cameras so that the entire length of a 20 or 36 exposure film cartridge may be shot in either sequence or individually without rewinding.

The ROBOT'S self-contained spring motor itself, provides the automatic film transport, shutter cocking and frame counting after each exposure, for rapid, single shots or Kino-

graphic (sequence) photography at up to 6 frames per second. The spring booster motor which attaches to the bottom of the ROBOT, even when fully wound, merely extends this automatic operation.

A rapid-action winding knob on the booster motor permits still longer runs, for use with the ROBOT'S high capacity 30 and 200 ft. magazines.

The pistol grip design of the booster motor lends itself excellently to rapid action and sequence shooting with the ROBOT.

Distributed in the U.S. exclusively by Karl HEITZ, Inc., 480 Lexington Ave., New York 17, N.Y., through franchised ROBOT dealers, the ROBOT Spring Booster Motor retails for $79.50.

PERUTZ 8 and 16mm REVERSIBLE BLACK AND WHITE FILM

Movie enthusiasts will be glad to know that once more they may shoot high quality black and white movies.

Perutz, one of the world's outstanding film makers, has undertaken to supply, through Burleigh Brooks Inc., its famous black and white emulsions. They are available in three speeds, 25, 100 and 400 ASA, to cover every need.

The 8mm is supplied in the usual double-8 spool and costs only $2.85 including processing. The film is returned to Burleigh Brooks for this purpose.

The 16mm is supplied in 50 and 100 ft. rolls and costs $3.30 and $5.75 respectively,

processing NOT included. However, there are many good processors available for this service, or it may be returned to Burleigh Brooks

Inc., 10 West 46th Street, New York City. Processing charge is $3.25 for one or two 50 ft. rolls, or for one 100 ft. roll. Price includes return shipping charges.

ROLITE ILLUMINATED VIEWER

The ROLITE, manufactured by Roloc, Inc., Milwaukee, offers a low-cost, compact, extremely cool and evenly illuminated viewer with a 25 x 34 inch viewing area.

Small business as well as large can afford a new viewer being manufactured by Roloc, Inc., Milwaukee, Wis.

Known as the ROLITE, it was designed primarily for the graphic arts field. However, due to its low-cost and versatility, anyone can use it to advantage.

Featuring extremely cool and even light distribution, it's ideal for color transparencies, as well as black and white. An illuminated viewing area of 25 x 34" permits the user to view, compare, study or analyze numerous transparencies at a time.

Unlike other viewers of comparable area, the ROLITE is less than 4½ inches thick. Over-all dimensions are 30⅜ x 36⅛ x 4⅜ inches. Light in weight, this new viewer is easily carried from room to room.

Stainless steel film clips hold negatives or plates in place over the viewing surface.

Perfectly square frame permits the use of a "T" square to convert the ROLITE into a stripping table. At slight additional cost, accessory legs may be purchased and in minutes the conversion to a table model is accomplished.

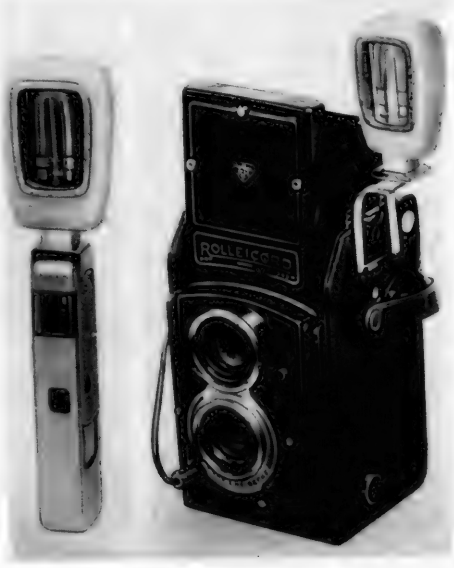
Other features are its Ceramic glass viewing surface, which is of double strength thickness. This glass is similar to opal glass, but is less brittle than opal, and is also less costly to replace. Only ONE 30-watt fluorescent tube is used for a light source. Unique reflector design makes the even light distribution possible. Access to the tube or starter is easily accomplished by removing the screws along the aluminum frame which surrounds the ceramic glass.

More and more uses are being discovered every day for the ROLITE. Stores and shops can use it for display purposes. Photo studios also use the ROLITE to display their photo art. For doctors, it becomes an excellent X-ray viewer.

Price is $69.95 FOB Milwaukee. For further details see your photo dealer or write directly to Roloc, Inc., 4217 W. North Ave., Milwaukee 8, Wisconsin.

MINIATURE SPEEDLIGHT FOR SUB-MINIATURE AND TWIN-LENS REFLEX CAMERAS

The Rectablitz, world's smallest electronic speedlight can now be supplied with a special



"direct-contact" shoe for use with Minox cameras without a synchronization cord. A special accessory clamp attaches the standard reflector to the case of any twin-lens reflex camera.

The miniature reflector, weighing only 1½ ounces and smaller in size than a pack of cigarettes (1 x 1½ x 1½ inches), provides perfectly uniform light distribution with guide numbers of 35 and 20 for Ektachrome and Kodachrome respectively.

The Rectablitz works on either three standard 1.5 volt dry cell batteries contained in a compact powerpack or with a simple accessory cord on 110-volt A.C. Recycling time with batteries is 8 to 10 seconds, with A.C. 2 seconds.

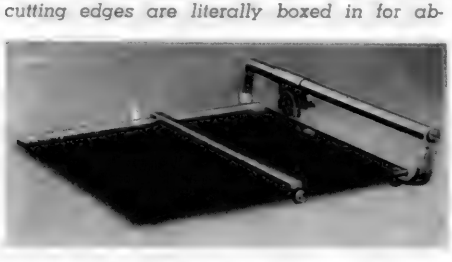
Distributed in the U.S., exclusively by Karl HEITZ, Inc., 480 Lexington Ave., New York 17, N.Y., through franchised dealers, the Rectablitz, including powerpack and A.C. cord, retails for $69.90 with either Minox or standard shoe. The accessory clamp for twin-lens reflex cameras lists for $4.95 and an extra reflector for $24.95.

NEW 16 AND 24 INCH NIKOR SAFETY TRIMMERS

Increasing demand for the popular all metal, rolling wheel Nikor paper cutters has made it possible for the manufacturer to extend the range of the line.

A new 16" and a new 24" are now being offered in addition to the well-known 12 and 20" models.

All the fine and sturdy Nikor features are retained. The rolling wheel is of optimum hardness and sharpens itself as it is used. The cutting edges are literally boxed in for ab-



solute safety. The new trimmers, as before, can be used safely and easily by people of all ages.

Burleigh Brooks Inc., 10 West 46th Street, New York 36, N.Y.

NEW BOOKLET GIVES DATA FOR PROPER SELECTION OF 16mm KODAK MOVIE FILMS

Eastman Kodak Company has announced the publication of a new booklet containing data needed to select the proper 16mm Kodak movie film for every type of job. It answers the need for this type of information of the professional who makes movies for industry, science, sports, and education as well as the amateur who makes movies solely for home use.

This booklet, "16mm Kodak Movie Films — Data and Selection," tells when and why to use reversal or negative type film, color or black-and-white movie film, and provides advice on loading, film storage, processing, duplicating, and the use of magnetic sound coating.

A special data section contains complete exposure information for indoor and outdoor shooting as well as information on exposure compensation when using filters. A suggested light-source-and-filter combination table is included for use with Kodachrome films.

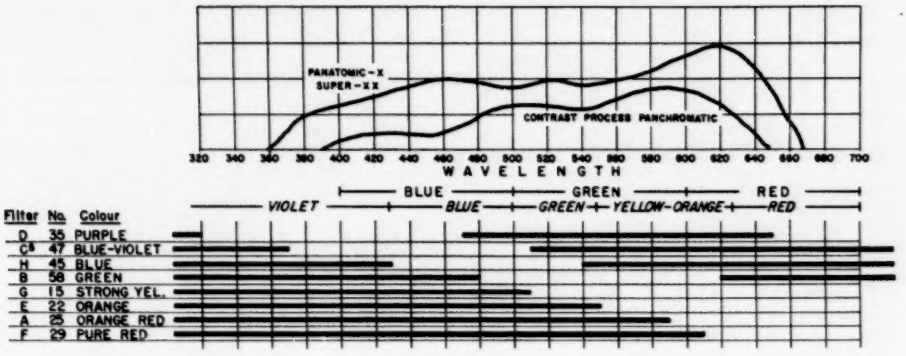
A large table provides package form, spooling, and identification data on all the 16mm Kodak movie films discussed in the booklet.

Copies of this new booklet on 16mm Kodak movie films may be obtained without charge from Eastman Kodak Company, Sales Service Division, Rochester 4, New York.

FILTER CHART FOR PHOTOMICROGRAPHY

The graph illustrated here has been devised as an aid in selecting filters for use in photomicrography. The occasional worker must rely most generally on either a table describing the filter characteristics, or must use the trial and error method in making a filter selection when taking a photograph of stained sections. Examination of the chart shown here will show how the absorption band of each filter is represented by a heavy black line, while the transmission band is represented by the absence of the black line.

The sensitivity curves of the films to be used are drawn on the upper graph and the wave length scale at the bottom of the graph also relates to the filter specifications. The visible wave length scale is divided roughly according to the three primary colors, blue, green and red, and further divided to show the regions occupied by the important color bands.



This particular graph shows the filters contained in the Wratten "M" set. The absorption line for other filters can be drawn on this chart if the spectral transmission in wave length is known. The same applies to the sensitivity curve of the particular films being used. The top line is shown here as an approximation for Panatomic X and Super XX. Both of these Panchromatic type B films resemble each other in this respect. Their main differences being in resolving power and exposure index. The bottom line labled Contrast Process Panchromatic shows at a glance how this film differs in color sensitivity. These curves were copied from the data sheets for each film. The same information for any film being used can be drawn on this graph.

In use the graph provides a quick reference for the transmission characteristics of any filter or combination of filters and relates this information directly to colors in the stained section and to the color sensitivity of the film being used. Visual inspection of the section being photographed will indicate which colors are to be darkened and lightened. The effect of the filters is predetermined by the chart and a selection made accordingly.

This chart could be expanded to include absorption characteristics of the various stains most often used, thereby increasing its usefulness.

Reference, "Photomicrography" and "Kodak Reference Handbook" — Eastman Kodak Co., Rochester, N. Y.

NEW FILTER INFORMATION FOLDER AVAILABLE WITH THE LATEST IN NEW DATA

New listings and new data makes ENTECO'S revised "Filter Information" literature the most informative and most convenient Filter Data Source available today. What's more, it's FREE.

Each type of filter is listed with a full explanation of what it does and how it's to be used. Selection Charts show the filter required in order to obtain the special effect desired. A very handy tabulation shows the recommended filters for use under specified lighting conditions with Kodacolor, Kodachrome (Type A, Type F and Daylight), Anscochrome and Super Anscochrome (Tungsten, Flash type, and Daylight), Ektachrome (Type F, Type B, and Daylight) and Ektacolor.

New Informative data has been added on new filter types, and filter recommendations for Super Anscochrome in both daylight and tungsten types.

There are in addition, Filter Factor charts which include use of Polarizers, A. S. A. Ratings for all popular films, color temperatures of common light sources, and others.

Copies may be had free for the asking, by writing to ENTECO at 610 Kosciusko Street, Brooklyn 21, New York.

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FELLOWSHIP PROCEDURE

Members may propose for Fellowship in the BPA other members whom they consider worthy of recognition. To be eligible for Fellowship a candidate must have been a member of the Association for five consecutive years and must possess one or more of the following qualifications:

Superior craftsmanship in still or motion picture photography of biological subjects.

Ability in photographic research in new methods or materials.

(These require submission of evidence.)

Meritorious contributions to biological photography overall through sustained organizational work.

Two sponsors are required. The sponsors should be well acquainted with the candidate's work and ready to furnish the Board with details of his experience and achievements. Those who wish to sponsor a member whom they believe to be eligible should request a Fellowship Application form from the Secretary of the Fellowship Committee: Mrs. Maria Ikenberg, University of Illinois, 904 W. Adams Street, Chicago 7, Illinois.

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